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10/734,442	12/12/2003	Helmut Steinhilber	074623.0111	9668

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EXAMINER
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JOERGER, KAITLIN S

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.



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**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

Application Number: 10/734,442  
Filing Date: December 12, 2003  
Appellant(s): STEINHILBER ET AL.

**MAILED**

NOV 14 2007

**GROUP 3600**

R. William Beard, Jr.  
For Appellant

**EXAMINER'S ANSWER**

This is in response to the appeal brief filed 6 August 2007 appealing from the Office action mailed 20 February 2007.

**(1) Real Party in Interest**

A statement identifying by name the real party in interest is contained in the brief.

**(2) Related Appeals and Interferences**

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

**(3) Status of Claims**

The statement of the status of claims contained in the brief is correct.

**(4) Status of Amendments After Final**

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

**(5) Summary of Claimed Subject Matter**

The summary of claimed subject matter contained in the brief is correct.

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

**(6) Grounds of Rejection to be Reviewed on Appeal**

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

**(7) Claims Appendix**

The copy of the appealed claims contained in the Appendix to the brief is correct.

**(8) Evidence Relied Upon**

4,579,329	FROST ET AL.	04-1986
62240237	TAKAHIRO Et Al.	10-1987

**(9) Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims:

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

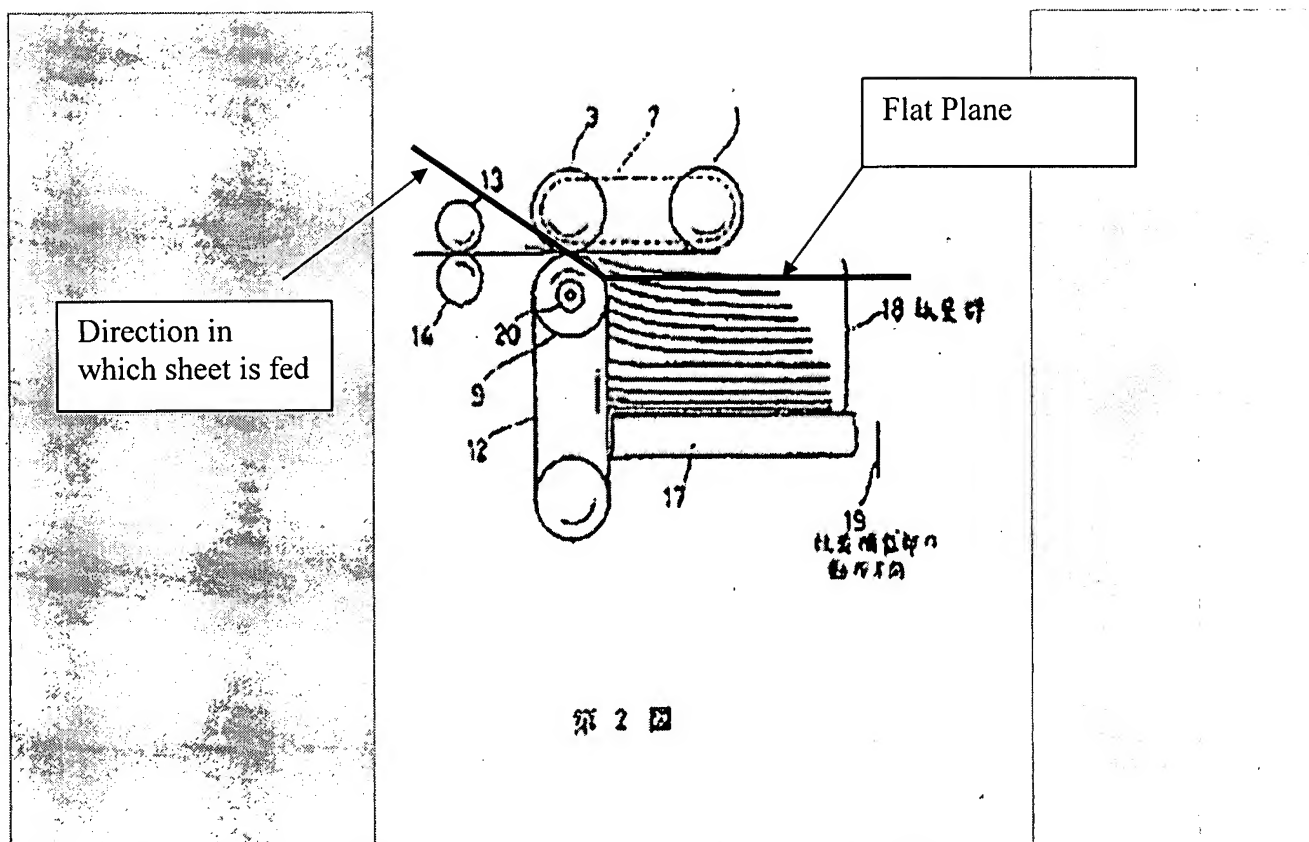
A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 6-10 are rejected under 35 U.S.C. 102(b) as being anticipated by JP 62240237 A.

The JP '037 patent teaches a device for selecting sheets of a record carriers from a pile, comprising:

- a rolling action device, 1, that lies on the uppermost sheet of the pile and exerts a rolling action on the uppermost sheet in a feeding direction, see figure 2;
- a stop, 12, mounted before the front edge of the pile pointing in the feeding direction, the front edge of the sheet is moved against the stop and wherein the stop can be moved upwards at an angle of more than 90 degrees to the flat plane and direction in which the sheet is fed, see figure 2 reproduced below:



As is clearly shown in the picture, the angle between the flat plane and the direction in which the sheet is fed is clearly more than 90 degrees.

The JP '037 patent further teaches:

- the stop moves in the plane of its surface;
- the stop is built of a belt, which runs upward under the impingement angle;
- the belt is an endless belt whose planar surface is turned towards the pile.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 62240237

A.

Although the JP '237 patent does not specifically teach a method for selecting sheets from a pile, it would have been obvious to one of ordinary skill in the art to perform the method steps of claims 1-3 using the apparatus taught by the JP '237 reference at the device of the JP

'237 comprises all the feature of the claimed invention and would perform the claimed method steps when used in it usual and expected manner.

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over JP 62240237 A in view of U.S. Patent No. 4,579,329.

The JP '237 patent does not teach a selection method wherein a dividing element is moved between the lifted front edge and the next sheet in the pile, but the '329 patent does. It would have been obvious to one of ordinary skill in the art to combine the dividing element of the '329 patent with the apparatus of the '237 patent in order to surely separate the top sheet from the pile and prevent two or more sheets from being removed from the pile at one time.

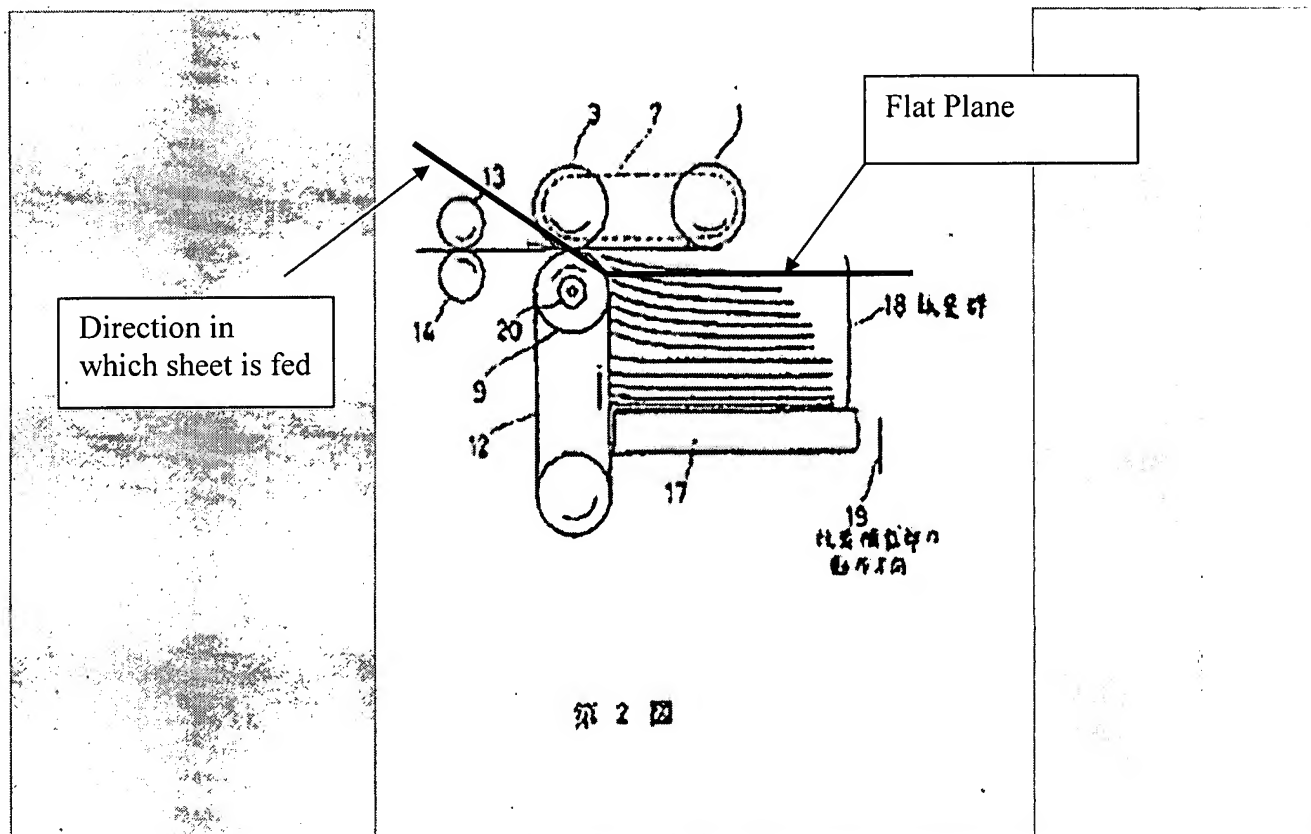
Claims 14-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 62240237 A in view of U.S. Patent No. 4,579,329.

The JP '237 patent does not teach a dividing element that can be mover between the lifted front edge and the next sheet in the pile, but the '329 patent does. The '329 patent teaches a dividing element, 20, mounted before the front edge of the pile that can be moved between the uppermost sheet and the following sheet in the pile, the dividing element intervenes by means of a finger and includes a press-on roller, see figure 8.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the dividing element of the '329 patent with the apparatus of the '237 patent in order to surely separate the top sheet from the pile and prevent two or more sheets from being removed from the pile at one time.

### (10) Response to Argument

Applicant's first argue that the feeding direction, as defined by the examiner with reference to Takahiro, is incorrect. The applicant's argue that the when the individual sheets are fed from the pile into the feed roller the sheets are horizontal, as shown in Figure 2, reproduced below.



The examiner is interpreting the phrase "feeding direction" to mean the direction in which the sheet is moved off of the pile, which is a reasonable interpretation to one of ordinary skill in the art. In this case, it is clear that the sheet is moved off of the pile at an upward angle, as clearly labeled in the figure above. What the applicant is defining as the feeding direction, the



horizontal direction of movement as the sheet is conveyed by the roller 14, is actually the conveyance direction.

The applicant further argues that, supposing the feed direction as defined by the examiner, is accepted as correct, than the impingement angle is less than 90°, see page 9 of Appeal Brief. However, what the applicant fails to see, and what the examiner argues, is that at the top of the belt, as the belt moves over the roller 9, the moving direction of the belt is the same as the feeding direction. Therefore, the impingement angle, defined as the angle between the a flat plane, the horizontal plane that the sheets are piled on, and a feed direction, is in fact greater than 90°, as clearly shown in the figure above.

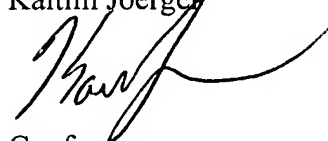
**(11) Related Proceeding(s) Appendix**

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Kaitlin Joergen



Conferees:

Meredith Petravick

Patrick Mackey



PTO 08-0365

CC=JP DATE=19871021 KIND=A  
PN=62240237

PAPER-FEED MECHANISM  
[Kyushi Kiko]

Takahiro Kawamoto, et al.

UNITED STATES PATENT AND TRADEMARK OFFICE  
Washington, D.C. October 2007

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INVENTOR (72): KAWAMOTO, TAKAHIRO; HIROMORI, KUNIO  
APPLICANT (71): NEC CORP.  
TITLE (54): PAPER-FEED MECHANISM  
FOREIGN TITLE [54A]: KYUSHI KIKO

## 1. Title of the Invention

Paper-Feed Mechanism

## 2. Claim(s)

A paper-feed mechanism characterized by comprising a paper stacking section which is vertically movable and stack paper sheets, a pusher roller which forwards one paper sheet at a time from the uppermost one paper sheet group stacked in said paper stacking portion, a picker roller which rotates synchronously with the pusher roller, a reverse roller which is rotated by maintaining a slight gap below the picker roller to rotatingly drive with the aforesaid picker roller in the opposite direction, a feed roller which forwards a paper sheet sent from the aforesaid picker roller, and a drawing belt which draws the end face of the aforesaid paper sheet group on the conveyance direction side.

## 3. Detailed Specifications

(Field of Industrial Application)

The present invention relates to a paper-feed mechanism for information systems, such as optical character readers, and to a friction-type paper-feed mechanism for feeding a paper sheet one at a time from the uppermost one of a stacked paper sheet group reliably at high speed.

(Prior Art)

The paper-feed mechanism of an optical character reader was composed in the past of a paper stacking section where paper to be processed was stacked, a pusher roller so arranged to come in direct contact with a

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\* Numbers in the margin indicate pagination in the foreign text.

paper sheet group stacked in this paper stacking section to forward one paper sheet at a time from the uppermost one of a stacked paper sheet group, a picker roller rotatably driven in forward in the paper-feed direction synchronously with this pusher roller, a reverse roller which rotatably drives backwards in the conveyance direction opposite that of the picker roller, and a feed roller which forwards a paper sheet sent from this picker roller 3 to a character recognition device itself.

(Problems to be Solved by the Invention)

In the case of the aforementioned conventional paper-feed mechanism, the pusher roller forwards the uppermost sheet of a paper sheet group stacked in a paper stacking section between the picker roller and the reverse roller, the picker roller and reverse roller send one uppermost 2 paper sheet of the paper sheets sent in from the pusher roller to the feed [misspelled in source] roller, and this feed roller feeds it to a character recognition device itself. Consequently, in order to feed one sheet reliably at high speed, it is necessary to finely adjust the gap between the reverse roller and picker roller as well as the contact pressure of the pusher roller.

That is, due to the need to process a large amount of information at high speed in optical character readers in recent years, in these same devices, it is necessary to process paper of different thicknesses, quality, etc. It is necessary to adjust the gap between the reverse roller and picker roller and the contact pressure of the pusher roller so that the gap is wide when the paper is thick or narrow when the paper is thin. If this adjustment is wrong, there is a problem because the paper becomes

damaged.

(Means for Solving the Problems)

In order to solve the aforementioned problems, the paper-feed mechanism provided in the present invention is characterized by comprising a paper stacking section which is vertically movable and stack paper sheets, a pusher roller which forwards one paper sheet at a time from the uppermost one paper sheet group stacked in said paper stacking portion, a picker roller which rotates synchronously with the pusher roller, a reverse roller which is rotated by maintaining a slight gap below the picker roller to rotatingly drive with the aforesaid picker roller in the opposite direction, a feed roller which forwards a paper sheet sent from the aforesaid picker roller, and a drawing belt which draws the end face of the aforesaid paper sheet group on the conveyance direction side.

(Practical Examples)

The present invention will now be described with reference to the drawings. Figure 1 is a perspective view of the paper-feed mechanism in a practical example of the present invention. A pusher roller 1 is linked to the shaft 4 of the picker roller 3 via an arm 2, and an endless belt 7 is hung between a picker roller-side pulley 5 and a pusher roller-side pulley 6. Consequently, the pusher roller 1 is rotatingly driven synchronously with the shaft 4, i.e., the picker roller 3. A reverse roller 8 is so installed to face the picker roller 3. It rotates in the direction of the arrow 18, and the uppermost paper sheet of the paper sheet group and bottom paper sheet that is to follow this paper sheet are separated. The paper sheet forwarded by the picker roller 3 is nipped

between feed rollers 13 and 14 and forwarded in the paper-feed direction 15. Furthermore, a roller a 9 is installed in the axial direction of the reverse roller 8, and a drawing belt 12 is hung between this roller a and a roller b 10 positioned below this roller a. This drawing belt 12 is rotatingly driven in the direction of the arrow 16 by a shaft 11. Moreover, this drawing belt 12 is set in a position coming in contact with the end face on the paper-feed direction 15 side of the paper sheet.

Moreover, here a roller a 9 and the reverse roller 8 rotate in opposite directions of each other, but the roller a 9 is attached to a shaft via a bearing 20; hence, the drawing belt 12 rotates in the opposite direction of the feed roller 14 without any hindrance.

Figure 2 is a side view of the actuating state of the paper-feed mechanism of the present invention in Figure 1. A paper sheet stacking section 17 and a stacked paper sheet group 18 are drawn toward the top of the end face on the paper-feed direction 15 side by the drawing belt 12. This drawing belt 12 draws the paper group so that it is rotated quicker than the paper sheet stacking section 17 moves in the operating direction shown by the arrow 19. At this time, the contact area with this drawing belt 12 is very small per paper sheet; hence, the end face of the paper sheet group 18 is lifted slightly on the paper-feed direction 15 side, as shown in Figure 2.

However, by drawing it in this way, a minute dislocation occurs between the respective paper sheets of the paper sheet group 18. Upon looking at the entire paper sheet group 18, which is affected by the weight of each paper sheet, a large dislocation is produced at the same pressure

as compared with the lower portion.

That is, the contact area between the 1<sup>st</sup> paper sheet from the top and the 2<sup>nd</sup> paper sheet from the bottom is smaller than the contact area between the 2<sup>nd</sup> paper sheet and 3<sup>rd</sup> paper sheet. Similarly, the contact area between the 2<sup>nd</sup> and 3<sup>rd</sup> paper sheets is smaller than the contact area between the 3<sup>rd</sup> and 4<sup>th</sup> paper sheets.

As a result, a dispersion in the frictional force generated between each paper sheet is produced, and the smaller the contact area between each paper sheet, the smaller the frictional force acting therebetween; hence, one sheet at a time can be forwarded easily and reliably from /3 the uppermost one of the paper sheet group 18 stacked in the paper stacking section, and it can be bitten into by the feed roller.

Furthermore, the rotating direction of the drawing belt 12 is directed upward; hence, since the force pressing constantly on the side of the pusher roller 1 acts on the paper sheet group 18 stacked in the paper sheet stacking section 17, making adjustment of the contact pressure of the pusher roller unnecessary, depending on the characteristics of the respective paper sheets. Moreover, the degree of freedom for selecting the roller surface material is increased due to the difference in the frictional coefficients, and a sheet can be fed reliably without performing a fine adjustment.

(Advantages of the Invention)

According to the paper feed mechanism of the present invention, dislocation can occur between each paper sheet by the drawing belt drawing the paper sheet group, and one sheet of paper at a time can be fed from



the uppermost one of the paper sheet group stacked in the paper stacking section.

As a consequence, it is not necessary to adjust the gap between the picker roller and reverse roller, or adjust the contact pressure with the pusher roller, as in the past.

#### 4. Brief Description of the Drawings

Figure 1 is a perspective view of the paper-feed mechanism of a practical example of the present invention and Figure 2 is a drawing of the operating state of the paper-feed mechanism in Figure 1.

1: pusher roller; 2: arm; 3: picker roller; 4: shaft a; 5: pulley; 6: pulley; 7: endless belt; 8: reverse roller; 9: roller a; 10: roller b; 11: shaft b; 12: drawing belt; 13: feed roller; 14: feed roller; 15: paper-feed direction; 16: rotating direction of drawing belt; 17: paper sheet stacking section; 18: paper sheet group; 19: actuating direction of paper sheet group; 20: bearing

Figure 1

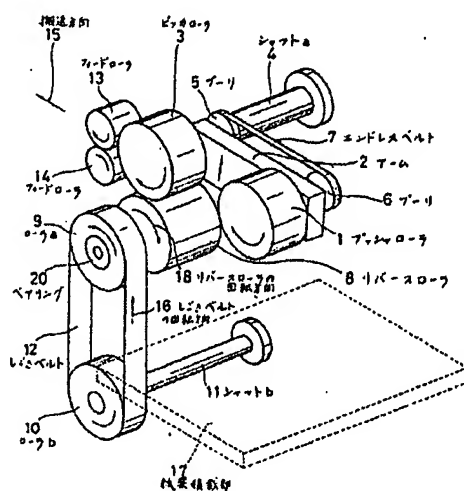


Figure 2

